

RESPONSE AND AMENDMENT

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and 18 are patentable over the cited prior art. Rather, such amendments along with new claim 26 are intended to broaden the scope of the invention. As such, the above amendments to claims 1 and 18 do not invoke the restrictions on the Doctrine of Equivalents as required under Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558 (Fed. Cir. 2000) (en banc). Consequently, the Applicant should be accorded the full scope of his claims under the Doctrine of Equivalents.

I. ELECTION/RESTRICTIONS

The Examiner has requested to affirm provisional election of an invention of claims 1 and 6-25.

In response, the Applicants confirm election of an invention of claims 1, 6-25. Thus, the claims 2-5 are withdrawn from consideration, with traverse.

II. REJECTION OF CLAIMS UNDER 35 U.S.C. §102(a)

The Examiner rejected claims 1, 8 and 9 as being anticipated by the Bang et. al patent (United States patent 6,110,556, issued Aug. 29, 2000). The rejection is respectfully traversed.

More specifically, the Examiner alleged in paragraph 5 of the Office Action that Bang et. al disclosed a chemical vapor deposition chamber comprising a vacuum lid comprising a base plate having a central recess and central gas feed channel in the bottom of the plate and two gas distribution plates which are mounted within the recess and provided with gas dispersion openings. The Examiner concluded that that applicant's invention is anticipated by Bang et. al. The Applicant respectfully disagrees.

"Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim." Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added). The Examiner's attention is directed to the fact that the plates 72 and 88 of Bang et. al. have flat top and bottom surfaces, i.e., the plates have no grooves. In other words, the reference does not teach a gas distribution plate disposed within a recess in a roof and having a plurality of blind radial grooves (i.e.,

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grooves that do not propagate to a peripheral edge of the plate) in fluid communication with the center gas feed wherein each radial groove comprises a plurality of apertures, as recited in Applicant's amended independent claim 1. Specifically, Applicant's amended claim 1 positively recites:

"Apparatus for gas distribution in a semiconductor wafer processing chamber comprising:

a roof fabricated from a silicon-based material and having a center gas feed;

a recess disposed within said roof;

a gas distribution plate disposed within said recess and having a plurality of blind radial grooves in a fluid communication with the center gas feed; and

a plurality of apertures disposed within said grooves and extending through the gas distribution plate." (emphasis added).

Support for the amendment can be found in FIG. 4 of the originally filed application; no new matter has been entered. Therefore, the Applicant contends that independent claim 1 is patentable over Bang et. al and, as such, fully satisfies the requirements of 35 U.S.C. §102 and is patentable thereunder.

Furthermore, claims 8 and 9 depend, either directly or indirectly, from claim 1 and recite additional features therefor. Since Bang et. al does not teach or disclose Applicants' invention as recited in claim 1, dependent claims 8 and 9 are also not anticipated and are allowable for at least the same reasons discussed above with respect to claim 1. Accordingly, the dependent claims also fully satisfy the requirements of 35 U.S.C. § 102 and are patentable thereunder.

III. REJECTION OF CLAIMS UNDER 35 U.S.C. §103(a)

A. The Examiner rejected claims 6, 7, 10-13, 16-19, 21-23, and 25 as being unpatentable over the Bang et. al patent (United States patent 6,110,556, issued Aug. 29, 2000) in view of the Collins et. al (United States patent 6,077,384, issued Jun. 20, 2000), Wicker et. al (United States patent 6,129,808, issued Oct. 10, 2000), and Wu (United States patent 5,910,221, issued Jun. 8, 1999). The rejection is respectfully traversed.

More specifically, the Examiner conceded in paragraph 7 of the Office Action that Bang et. al fails to teach that the roof and gas distribution plate are made and covered

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with silicon carbide. The Examiner alleged that Collins teaches a plasma reactor with a ceiling made from silicon carbide, Wicker discloses a gas distribution plate made or coated with silicon carbide, and Wu teaches coating the plasma reactor's base plate with a silicon carbide film. As such, the Examiner concluded that it would have been obvious to one of ordinary skills in the art to provide the apparatus of Bang et. al with a roof and gas distribution plate made from and covered with silicon carbide. The Applicant respectfully disagrees.

As discussed above, Bang et. al teaches the gas distribution plates 72 and 88 that have flat top and bottom surfaces without grooves as claimed in the independent claims of the subject invention. Collins et. al teaches a flat ceiling 110 having a silicon wafer (gas distribution plate) 985 disposed in a recess 960 in a top portion of the ceiling 110 (FIGS. 36A and 36B, col. 27, line 11 – col. 28, line 1). The silicon wafer 985 has flat top and bottom (i.e., no grooves) surfaces and comprises a plurality of gas distribution apertures formed through the plate. Wicker et. al teaches a gas distribution plate 120 supplied with a gas from a periphery of the plate 120 via fully extending (to the periphery) through channels 120a (FIG. 8). Wu teaches a coated composite base (ceiling) 102 having a dome (recess) 106. Wu does not teach any gas distribution plate in the recess or elsewhere.

The Examiner's attention is directed to the fact that the alleged references, either singly or in any permissible combination, do not teach, suggest, or otherwise render obvious an apparatus provided with a gas distribution plate comprising a plurality of blind radial grooves in a fluid communication with a center gas feed wherein each radial groove comprises a plurality of apertures, as recited in Applicants' independent claim 1 as discussed above or independent claim 18. Furthermore, claims 6, 7, 10-13, 16-17, 19, 21-23, and 25 depend, either directly or indirectly, from claims 1 and 18 and recite additional features therefor. Since the combination of Bang et. al, Collins et. al, Wicker et. al, and Wu would not produce Applicant's invention as recited in claims 1 and 18 for the reasons stated above, dependent claims 6, 7, 10-13, 16-17, 19, 21-23, and 25 are also not obvious and are allowable.

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B. The Examiner rejected claims 14 and 15 as being unpatentable over the Bang et. al patent (United States patent 6,110,556, issued Aug. 29, 2000) in view of the Collins et. al (United States patent 6,077,384, issued Jun. 20, 2000), Wicker et. al (United States patent 6,129,808, issued Oct. 10, 2000), Wu (United States patent 5,910,221, issued Jun. 8, 1999) and further in view of Fischer (United States patent 5,422,139, issued Jun. 6, 1995).

The applicants have canceled claims 14 and 15, therefore the rejection of these claims now is moot.

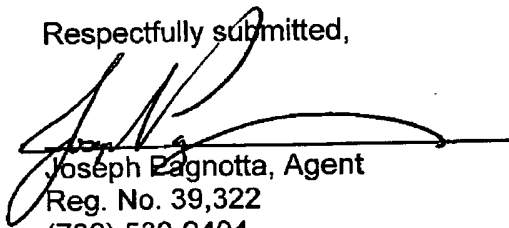
CONCLUSION

Thus, the Applicants submit that none of the claims presently in the application are indefinite under the provisions of 35 U.S.C. § 112, anticipated under the provisions of 35 U.S.C. §102, or obvious under the provisions of 35 U.S.C. § 103. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Raymond R Moser Jr., Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

Sept. 9, 2002


Joseph Pagnotta, Agent
Reg. No. 39,322
(732) 530-9404

Moser, Patterson & Sheridan, LLP
Attorneys at Law
595 Shrewsbury Avenue
Suite 100
Shrewsbury, NJ 07702

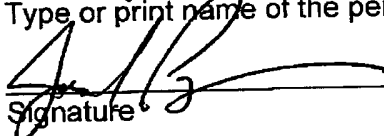
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Please continue to direct all correspondence to:

Patent Counsel
Applied Materials, Inc.
3050 Bowers Avenue
P. O. Box 450A
Santa Clara, CA 95052

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APPENDIX 1

Marked-up claims

Please cancel claims 14, 15 and 20.

Please rewrite claims as follows:

1. (Amended) Apparatus for gas distribution in a semiconductor wafer processing chamber comprising:

- a roof fabricated from a silicon-based material and having a center gas feed;
- a recess disposed within said roof;
- a gas distribution plate disposed within said recess and having a plurality of blind radial grooves in a fluid communication with the center gas feed; and
- a plurality of apertures disposed within the radial grooves [roof] extending [from] through the gas distribution plate.

18. (Amended) Apparatus for gas distribution in a semiconductor wafer processing chamber comprising:

- a roof having a top surface and a bottom surface and having a center gas feed;
- a recess disposed within the bottom surface of said roof;
- a gas distribution plate disposed within said recess and having a plurality of blind radial grooves in a fluid communication with the center gas feed; and
- a material layer coating disposed upon the bottom surface of the roof and the gas distribution plate.

26. (New) The apparatus of claim 13 wherein the apertures of the gas distribution plate coincide with the apertures in the material layer.